Ohio Academy of Science
95th Annual Meeting
The University of Toledo
April 25-27, 1986

[Guide to the 61st Annual Field Conference of the Section of Geology]

April 27, 1986

The Geology of Kelley's Island, Ohio

Leaders: M.J. Camp, C. B. Hatfield, and J. L. Forsyth

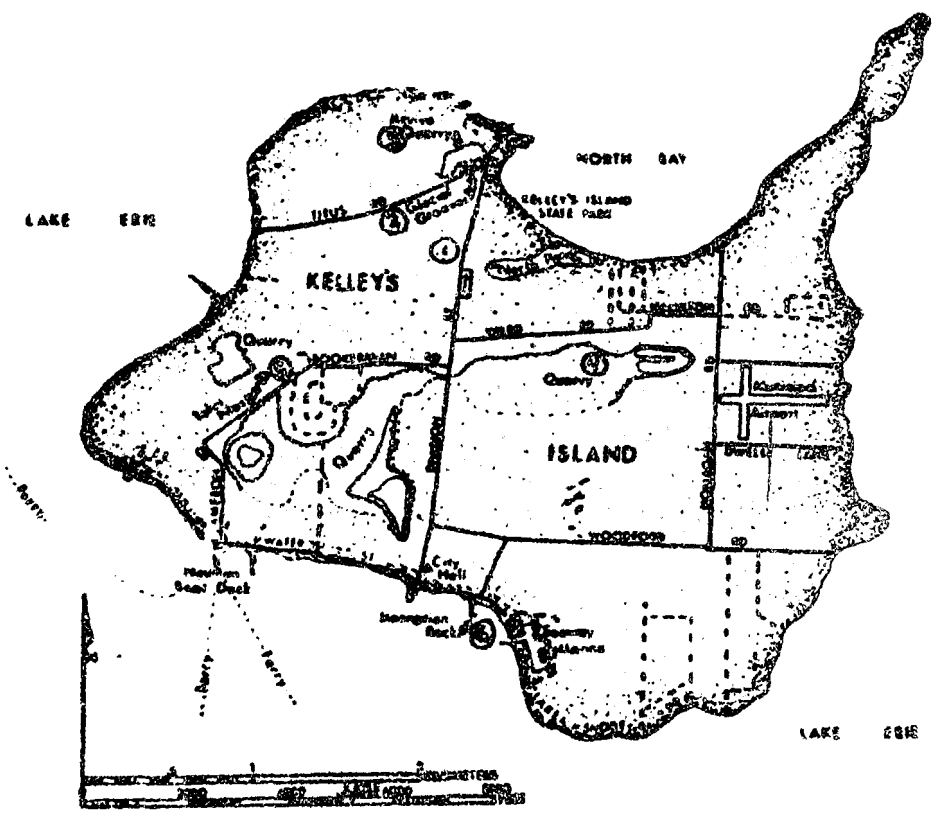
The annual Ohio Academy of Science geology field trip will leave parking lot #13, just north of the West Ramp and Bowman-Oddy Laboratories, at 9:00 a.m. on Sunday, April 27. Transportation will be by departmental van and private cars. Individuals in private cars may follow the vans or meet at the ferry dock in Marblehead, Ohio (directions will be available on Saturday) for a 10:30 A. M. ferry departure. The trip will proceed to Kelley's Island for observation of glacial grooves, Indian petroglyphs and Devonian stratigraphy.

Title page constructed from information in the Ohio Journal of Science, v. 86, no. 2, p. iv.

1986 OAS FIELD TRIP
THE GEOLOGY OF
KELLEY'S ISLAND, OHIO
Leaders: M.J. Camp and C.B. Hatfield with assistance from J.L. Forsyth

- Meet at Neuman Boat Line Dock in Marblehead, Ohio. Ferry leaves promptly at 10:30 a.m. Parking spaces are limited, so arrive early.

A 20 minute ride will take us across the shallow western basin of Lake Erie, more or less paralleling the Middle Devonian Columbus Limestone cuesta (You drove up onto this cuesta at Lakeside on Rt. 163). On the journey to Kelley's a similar cuesta of Silurian Put-in-Bay Dolostone may be seen to the west where it forms the Bass Islands. As the ferry approaches Kelley's Island note the high lake level; many shoreline features are submerged and at least one site that we would normally visit is inaccessible.



Map of Kelley s Island, Ohio showing geologic features.
(Adapted from Feldmann, Coogan, and Heimlich, 1977)

- Follow Water St. to downtown Kelley's Island.
- Turn left on Division St.
- Intersection with Woodford Rd., Quarry on left (west)
- Quarry on right (east)
- After passing junction with Ward Rd., Division St dips into Sweet Valley.

Stop #1 At this point one can observe early shorelines to the south and north. During a higher lake stand Kelley's was divided into two smaller islands. The northern island is the site of the famous glacial grooves. Back in the 1830's two ponds existed on Kelley's, one just south of North Bay and another just north of South Bay. Both ponds were at one time part of Lake Erie, but have since been cut off by sedimentation.

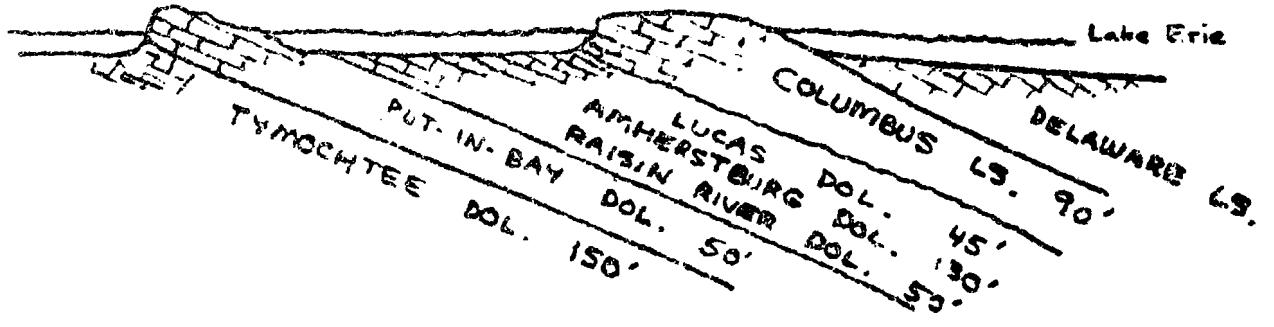
At times of lower lake level South Bay has been partially exposed adding a considerable land area to the island as recorded by Hills (1925). Rising water levels have however caused great erosional problems along the low-lying east and south shore especially during ice breakup. Sea cliffs protect the western and northern shores.

Stop #2 The Glacial Grooves

The famous Kelley's Island grooves were at one time much more extensive, but much of the bedrock surface was quarried away during enlargement of North Quarry. Here the Columbus cuesta was first striated and then certain striae were enlarged by resistant rocks entrained in the base of the ice sheet. The ice lobe moved in a northeast to southwest direction.

Stop #3 North Quarry

Follow steep overgrown road down into the quarry. This quarry was originally opened in the early 1830's, practically abandoned a few years later and then enlarged and improved in the 1870's. As we descend, the stratigraphy of the Columbus Limestone will be pointed out. The upper more thinly bedded Columbus is well exposed including characteristic rugosid anthozoans. The Columbus becomes more massive, less fossiliferous, and more dolomitic down section. Fisher (1922) described the base of the quarry as Lucas Dolomite.



East-West Geologic Cross Section from South Bass to Kelley's Island, Ohio
(Adapted from Forsyth, 1971)

- Follow Division St. south to Ward Rd., turn left

Stop #4 Abandoned Quarry
More exposures of Columbus Limestone and a good overview of quarry succession. Typical Columbus fossils may be collected here.

PORIFERA

Stromatopora sp.

COELENTERATA

Aulopora expatiata
Coenites sp.
Cystiphylloides sp.
Emmonsia sp.
Eridophyllum sp.
Favosites sp.
Heliophyllum halli
Hexagonaria prisma
Siphonophrentis gigantea
Synaptophyllum simcoense
Syringopora sp.
Zaphrentis corniculum

BRYOZOA

Fenestrellina sp.
Sulcoretepora sp.

BRACHIOPODA

Brevispirifer gregarius
Chonetes sp.
Leptaena rhomboidalis
Megastrophia hemisphaerica
Paraspirifer acuminatus
Stropheodonta sp.

MOLLUSCA
BIVALVIA

Conocardium cuneus
Paracyclas elliptica

GASTROPODA

Acanthonema newberryi
Elasmonema bellatulum
Isonema humile
Loxonema sp.
Palaeotrochus kearneyi
Platyceras dumosum
Pleuronotus decewi

CEPHALOPODA

Acleistoceras sp.
Ryticeras cyclops

ARTHROPODA
TRILOBITA

Proteus rowii

Some Representative Columbus Limestone Taxa

- Return back Ward Rd., turn left on Division and right on Bookerman Rd.

Stop #5 This is the most recent quarry on Kelley's to shut down. The upper section of Columbus Limestone is well exposed here. In the pit the massive lower Columbus is exposed. The characteristic chert zone and a thin shale band is well exposed near the base of the quarry. Fossils may be collected at this site.

- Follow Bookerman Rd. to Cameron Rd.

An old lime kiln is visible on the left in the trees as we approach the junction of Water St.

- Turn right on Water St.

Optional Stop Old loading dock of Kellstone Quarry built circa 1902 by Kelley Island Lime and Transport Co.

- Follow Titus Rd. back to the state park

- Turn right on Division St. and follow it to Water St. turn left

Stop # Inscription Rock

Iroquois Indians reportedly left petroglyphs on this limestone mass. Inscription Rock was discovered in 1834. Schoolcraft recorded the original drawings and sketches of two Indian Village sites and several mounds in a 1853 Federal publication. The markings were nearly indiscernible in the 1920's so little is visible today.

At the time the rock was discovered, the north end was covered by soil. Wave erosion, however soon completely exposed the feature.

Inscription Rock as it Appeared in 1850

(Hills, 1925)

Return to ferry.